

**SOLAR BATTERY MODULE, METHOD OF MANUFACTURING THE SAME AND FRAME BODY THEREFOR**

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**Abstract**

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**PROBLEM TO BE SOLVED:** To secure sufficient stop performance between a solar battery module body and a frame body, and to realize satisfactory stop workability on a solar battery module where the outer peripheral part of the solar battery module body is engaged with the frame body.

**SOLUTION:** A stop member 61 is previously arranged in a groove 54e formed in a frame member 54 constituting a frame body. When the outer peripheral part of the solar battery module body 4 is engaged with the groove 54e, the stop member 61 is deformed along the inner face of the groove 54e by pressure force operated from the solar battery module body 4, and the stop member 61 is compressed/deformed so that it is wound to the outer peripheral part of the solar battery module body 4.

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# **Solar Battery Module, Method of Manufacturing The Same and Frame Body Therefor**

(Machine Translated Version)

## **[Claim(s)]**

[Claim 1] The solar cell module characterized by inserting in the periphery part of the body of a solar cell module, inserting in a slot, and being produced, making the thrust from the body of a solar cell module act, and carrying out the compression set of this water cutoff member to the water cutoff member arranged in the insertion slot of this frame in the production process of the above-mentioned frame in the solar cell module with which the periphery part of the body of a solar cell module is inserted in a frame, and changes.

[Claim 2] It is the solar cell module characterized by the water cutoff member consisting of charges of foam in a solar cell module according to claim 1.

[Claim 3] In the manufacture approach of the solar cell module manufactured by inserting the periphery part of the body of a solar cell module in a frame The water cutoff member arrangement process of making the water cutoff member arranging in the insertion slot of this frame at the time of manufacture of the above-mentioned frame, Insert in the periphery part of the above-mentioned body of a solar cell module, and it inserts in a slot. The manufacture approach of the solar cell module characterized by having the insertion process which inserts in carrying out the compression set of the water cutoff member by the thrust from the body of a solar cell module in that case, and closes the clearance between a slot and the periphery part of the body of a solar cell module.

[Claim 4] The manufacture approach of the solar cell module characterized by arranging the water cutoff member of a class which is different in a part for both ends and the central part of a longitudinal direction of an insertion slot in the manufacture approach of a solar cell module according to claim 3.

[Claim 5] The manufacture approach of the solar cell module characterized by inserting in a water cutoff member, making it deform in accordance with the inside configuration of a slot, and twining this water cutoff member round [ the rim part of the body of a solar cell module ] by attaching the water cutoff member only in one side of the edges of the pair which constitutes the open side edge edge of an insertion slot in the manufacture approach of a solar cell module according to claim 3 or 4, and inserting the body of a solar cell module in the above-mentioned insertion slot.

[Claim 6] The manufacture approach of the solar cell module characterized by attaching a water cutoff member only in the field which counters a front-face side among the fields which counter a field [ which counters the front-face side of the body of a solar cell module in an insertion slot ], and rear-face side in the manufacture approach of a solar cell module according to claim 3 beforehand.

[Claim 7] The manufacture approach of the solar cell module characterized by inserting the water cutoff member which has a bigger cross-section configuration than the cross-section configuration of this insertion slot inside an insertion slot in the state of compression in the manufacture approach of a solar cell module according to claim 3.

[Claim 8] It is the manufacture approach of the solar cell module characterized by for the edge sections of two or more frame materials contacting, constituting the frame by concluding these contact sections, and attaching beforehand the water cutoff member of the configuration which carried out abbreviation agreement in the configuration of the contact part of this frame material contacted mutually at the frame material of one side in the manufacture approach of the solar cell module any or one publication among claims 3-7.

[Claim 9] It is the manufacture approach of the solar cell module characterized by for the frame being constituted by two or more frame materials which have closed section structure, and arranging the water cutoff member in the interior of this frame material in the state of compression in the manufacture approach of the solar cell module any or one publication among claims 3-7.

[Claim 10] The manufacture approach of the solar cell module characterized by using the water cutoff member which consisted of charges of foam in the manufacture approach of the solar cell module any or one publication among claims 3-9.

[Claim 11] The frame for solar cell modules which it is used for the manufacture approach of the solar cell module any or one publication among above-mentioned claims 3-10, and a water cutoff member is arranged in an insertion slot, and changes.

## **[Detailed Description of the Invention]**

[0001]

[Field of the Invention] This invention relates to the frame for solar cell modules used for the solar cell module installed in the roof part of a housing building etc., and the manufacture approach list of this solar cell module by it. It is related with the amelioration for securing especially the water cutoff engine performance between the body of a solar cell module, and the frame which supports it.

[0002]

[Description of the Prior Art] The solar battery which is conventionally generated using clean solar energy with very little effect on earth environment unlike the thermal power station which burns fossil fuels, such as petroleum, nuclear electric power generation with difficult processing of trash, etc. is known. This solar battery is being adopted also as a common residence with the fall of a price in recent years. By preparing the privately owned electrical power facilities by such solar battery, it becomes possible to obtain power, without requiring the power transmission from an electric power company in the daytime. And when dump power arises in a generation of electrical energy in the daytime, it is also possible to carry out the electricity sales to utilities of this dump power to an electric power company.

[0003] Generally, this kind of solar battery has the solar cell module with which the body of a solar cell module was supported and constituted by the frame. That is, the slot for inserting in the periphery section of the body of a solar cell module is established in the frame, and these both are made to unify by inserting the periphery section of the body of a solar cell module in this slot.

[0004] By the way, such a building-materials one apparatus solar cell module of a configuration fully secures the water cutoff engine performance between the body of a solar cell module, and a frame, and it is necessary to make it storm sewage etc. not

permeate from the clearance between these both. Hereafter, the conventional water cutoff method is explained.

[0005] - Method which used the wet sealing material - As shown in drawing 16 (a), this method pours sealing material d, such as silicon resin, into the clearance c between the body a of a solar cell module, and Frame b, and fills this clearance c.

[0006] - elastic material compression method - this method makes the elastic material e, such as EPDM (ethylene-propylene-diene terpolymer), intervene between the body a of a solar cell module, and Frame b, as shown in drawing 16 (b) That is, when the body a of a solar cell module is inserted in the slot b1 of Frame b, the configuration of the clearance formed among these both a and b is made to carry out abbreviation agreement, and the elastic material e is formed in it (the elastic material e is formed in a slightly larger configuration than this clearance configuration in fact). And while inserting this elastic material e in the slot b1 of Frame b, the periphery section of the body a of a solar cell module is inserted in this elastic material e (refer to drawing Nakaya mark). Under the present circumstances, between Frame b and the body a of a solar cell module, the elastic material e will be compressed and between the inside of the slot b1 of Frame b and the bodies a of a solar cell module will be filled without a clearance.

[0007] - foam compression method - this method is indicated by JP,9-217470,A. As shown in drawing 16 (c), the periphery section of the body a of a solar cell module is beforehand pasted up and equipped with the water cutoff member f which changes by foam, and, specifically, the periphery section of this body a of a solar cell module is inserted in the slot b1 of Frame b. Thereby, like the elastic material compression method mentioned above, a clearance is lost between Frame b and the body a of a solar cell module, and the good water cutoff engine performance can be obtained.

[0008]

[Problem(s) to be Solved by the Invention] However, a technical problem which is described below occurred by the all directions formula mentioned above.

[0009] - Since the technical-problem-book method of the method which used the wet sealing material pours a wet sealing material into few clearances between the body of a solar cell module, and a frame, it is difficult for it to check whether the perimeter enclosure of a solar battery is covered and water can be cut off completely, and the dependability of the water cutoff engine performance cannot fully secure it.

[0010] Moreover, if a wet sealing material does not harden completely, sufficient water cutoff engine performance will not be obtained. For this reason, the predetermined drying time was needed after impregnation of a wet sealing material, and the technical problem that working hours will be required for a long time occurred. Moreover, the check of the hardening was complicated.

[0011] Furthermore, when the wet sealing material had adhered to parts other than a need part during an activity, the wiping activity was needed and aggravation of working efficiency was caused.

[0012] - When the configuration of the clearance between the body of a technical-problem-solar cell module of an elastic material compression method and a frame is complicated, processing of elastic material will become complicated. Moreover, when the configuration of a clearance is complicated in this way, by elastic material, it may become impossible to fill completely the clearance between a frame and the body of a solar cell module, and the dependability of the water cutoff engine performance cannot

fully secure it.

[0013] Moreover, there is no versatility over two or more kinds of solar batteries. That is, if it puts in another way according to the configuration of the above-mentioned clearance, since it is necessary to prepare the elastic material of dedication according to the class of solar battery, a standardization of elastic material is difficult and will cause increase of cost.

[0014] - As well as the case of the technical-problem-above-mentioned elastic material compression method of a foam compression method when the configuration of a clearance is complicated, the dependability of the water cutoff engine performance may fully be unable to secure. moreover, when the periphery section of the body of a solar cell module was inserted in the slot on the frame, possibility that foam will begin to see to the light-receiving side side of a solar battery was high, removal of foam (foam which it began to see) excessive as after treatment of the above-mentioned insertion activity was needed, and aggravation of working efficiency was caused. Moreover, the design of the foam for avoiding the flash of this foam was difficult.

[0015] As mentioned above, by each conventional water cutoff method, neither of both sides of reservation of sufficient water cutoff engine performance and good water cutoff workability were securable.

[0016] Thatching a solar battery directly as roofing material is performed without using a roofing tile with the fireproof improvement in a solar cell module especially in recent years. If it is in a such type solar cell module, since a solar battery functions also as a roofing tile, aiming at improvement in the dependability of the above-mentioned water cutoff engine performance poses a much more important problem. Moreover, when applying to the residence (for example, residence with an area of the seashore to 500m) near the seashore, in order to be anxious about the salt damage by the salinity of the ultralow volume contained in atmospheric air, it is also important to realize the configuration for preventing invasion of this salinity.

[0017] This invention is made in view of this point, and the place made into the purpose is to provide with the frame for solar cell modules the manufacture approach list of the solar cell module and solar cell module which can acquire good water cutoff workability while aiming at reservation of sufficient water cutoff engine performance, and positive inhibition of invasion of salinity.

[0018]

[Means for Solving the Problem] - Outline of invention - In order to attain the above-mentioned purpose, this invention arranges the water cutoff member which closes the clearance between the body of a solar cell module, and the frame which supports it in the insertion slot formed in the frame at the time of manufacture of a frame, and above-mentioned both water cutoff structure is made to be acquired by the insertion activity and coincidence of the body of a solar cell module.

[0019] - Solution means - This invention is premised concrete on the solar cell module with which the periphery part of the body of a solar cell module is inserted in a frame, and changes. While making the thrust from the body of a solar cell module act and carrying out the compression set of this water cutoff member to the water cutoff member arranged in the insertion slot of this frame in the production process of a frame in this solar cell module, the periphery part of the body of a solar cell module should be inserted in, and it should insert in the slot, and should be produced.

[0020] Moreover, it inserts in with a water cutoff member arrangement process, and the process is made to have as the manufacture approach of this solar cell module. A water cutoff member arrangement process is performed at the time of manufacture of a frame, and makes the water cutoff member arrange in the insertion slot on the frame. At an insertion process, the periphery part of the body of a solar cell module is inserted in, and it inserts in a slot, and it inserts in, carrying out the compression set of the water cutoff member by the thrust from the body of a solar cell module in that case, and the clearance between a slot and the periphery part of the body of a solar cell module is closed.

[0021] According to these specification matter, the water cutoff structure between these both can be acquired to the insertion activity and coincidence of the body of a solar cell module. And this water cutoff structure is acquired as a very high thing of the water cutoff engine performance by the compression set of a water cutoff member. Therefore, coexistence with reservation of sufficient water cutoff engine performance and good water cutoff workability can be aimed at. Moreover, even if it is the case where it applies to the residence near the seashore in connection with the water cutoff engine performance being secured, concern of the salt damage by the salinity of the ultralow volume contained in atmospheric air is cancelable. Furthermore, since he is trying to arrange a water cutoff member in a frame at the time of frame manufacture, the production processes of the body of a solar cell module with much processing routing can be reduced, and improvement in the productivity of the body of a solar cell module can also be aimed at.

[0022] Arranging the water cutoff member of a class which is different in a part for both ends and the central part of a longitudinal direction of an insertion slot as one of the concrete technique of the manufacture approach of the above-mentioned solar cell module is hung up.

[0023] According to this specific matter, the water cutoff engine performance demanded by every place of the longitudinal direction of an insertion slot can be obtained to arbitration. For example, when the high water cutoff engine performance is especially required by part for the both ends of the longitudinal direction of an insertion slot, what has a high consistency is adopted for the water cutoff member adopted as this part.

[0024] By attaching the water cutoff member only in one side of the edges of the pair which constitutes the open side edge edge of an insertion slot as other technique of the manufacture approach of a solar cell module, and inserting the body of a solar cell module in an insertion slot, insert in a water cutoff member, it is made to deform in accordance with the inside configuration of a slot, and twining this water cutoff member round [ the rim part of the body of a solar cell module ] is hung up.

[0025] According to this specific matter, a water cutoff member can be twined good to the body of a solar cell module of any configurations, and the water cutoff engine performance between frames can be obtained good.

[0026] the manufacture approach of a solar cell module -- being the further -- others -- attaching a water cutoff member only in the field which counters a front-face side among the fields which counter a field [ which counters the front-face side of the body of a solar cell module in an insertion slot as technique ], and rear-face side beforehand is hung up.

[0027] According to this specific matter, water can be cut off good by the compression set of a water cutoff member in the clearance between frames the front-face side of the body of a solar cell module. That is, the configuration which can prevent permeation

certainly to the storm sewage with which we are anxious about especially permeation is obtained.

[0028] Furthermore, how to insert in the interior of an insertion slot the water cutoff member which has a bigger cross-section configuration than the cross-section configuration of this insertion slot in the state of compression is employable.

[0029] According to this specific matter, when a water cutoff member is inserted in an insertion slot, a water cutoff member will be held in this insertion slot. That is, since it is not necessary to paste up a water cutoff member, exfoliation of a releasing paper like [ at the time of using adhesive tape ] becomes unnecessary, and an activity man day can be reduced.

[0030] The following are hung up as an approach of cutting off water in parts other than between a solar cell module and a frame. That is, the edge sections of two or more frame materials are made for a frame to contact, and it constitutes by concluding these contact sections. Moreover, the water cutoff member of the configuration which carried out abbreviation agreement is beforehand attached in the configuration of the contact part of this frame material contacted mutually at the frame material of one side.

[0031] Moreover, two or more frame materials which have closed section structure constitute the frame, and a water cutoff member is arranged in the interior of this frame material in the state of compression.

[0032] The water cutoff engine performance of the whole solar cell module is securable good conjointly with each above-mentioned water cutoff structure with these specification matter.

[0033] The charge of foam is hung up as a concrete ingredient which constitutes the above-mentioned water cutoff member. According to this, elasticity good to a water cutoff member is acquired, and the water cutoff engine performance by the compression set is fully demonstrated.

[0034] Furthermore, the arrangement process of a water cutoff member is incorporable in the production process of a frame by using the frame for solar cell modules in the manufacture approach of each solar cell module mentioned above. That is, the configuration for obtaining the water cutoff engine performance to manufacture and coincidence of a frame is realizable. For this reason, by adoption of this frame, the process for making the body of a solar cell module equipped with a water cutoff member becomes unnecessary, and improvement in the productivity of the body of a solar cell module can be aimed at.

[0035]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained based on a drawing. Moreover, this gestalt explains the case where this invention is applied to the solar cell module directly thatched by the roof part of a residence.

[0036] Drawing 1 is the perspective view showing the roof part of the residence where the solar cell module 2 concerning this operation gestalt is thatched. As shown in this drawing, the roof 1 of this residence is a gable type thing, it continues all over the abbreviation for the roof side (for example, roof side facing on the south) 11 of one side, and two or more solar cell modules 2 and 2 and -- are thatched. On the other hand, the roofing tile which is not illustrated is thatched by the roof side (for example, roof side facing the north side) 12 of another side.

[0037] Each above-mentioned solar cell modules 2 and 2 and -- are arranged in the shape of a matrix in the extended direction of a ridge, and the inclination direction of a roof 1. Moreover, a solar cell module 2 has sufficient refractoriness (refractoriness comparable as a roofing tile). For this reason, a roofing tile is not thatched by these solar cell modules 2 and 2 and the roof side 11 where -- was put in order, but solar cell modules 2 and 2 and -- itself are directly thatched as roofing material.

[0038] - Explain the configuration of a solar cell module 2 below configuration - of a solar cell module 2. Each solar cell modules 2 and 2 and -- change with the same configuration mutually. Concretely, the solar cell module 2 is constituted by the body 4 of a solar cell module, and the frame 5 as shown in drawing 2 . B view Fig. [ in / drawing 2 (a), and / in drawing 2 (b) / drawing 2 (a) ] and drawing 2 (c) are C view Figs. in drawing 2 (a). [ the top view of a solar cell module 2 ]

[0039] The body 4 of a solar cell module is produced by laminating the photovoltaic cell 41 formed with polycrystalline silicon with tempered glass 42, as shown in drawing 8 . Thereby, this body 4 of a solar cell module is constituted as rectangle-like sheet metal with which weatherability was secured. Moreover, the closure member 43 which changes by elastic material, such as rubber, is attached in the periphery edge of the rear face (field which counters the sarking of a roof) of the body 4 of a solar cell module. In addition, the above-mentioned photovoltaic cell 41 may be formed with single crystal silicon, an amorphous silicon, etc.

[0040] As shown in drawing 2 and drawing 3 (decomposition perspective view of the III part in drawing 2 ), a frame 5 holds the neighborhood of the above-mentioned body 4 of a solar cell module, is equipped with the top frame material 51, the bottom frame material 52, and the side edge frame materials 53 and 54 of a right-and-left pair, and is formed in the shape of a frame by attaching these frame materials 51, 52, 53, and 54 in one. In addition, drawing 3 shows the attachment part of the bottom frame material 52 and the right-hand side side edge frame material 54.

[0041] Each frame materials 51, 52, 53, and 54 are fabricated by the extrusion of aluminum, respectively. The top frame material 51 holds the edge located in the housing building side in the body 4 of a solar cell module. The bottom frame material 52 holds the edge located in the housing eaves side in the body 4 of a solar cell module. Each side edge frame materials 53 and 54 have connected the both-ends edges of the above-mentioned top frame material 51 and the bottom frame material 52 while holding the right-and-left edges on both sides of the body 4 of a solar cell module, respectively.

[0042] Next, the configuration of each [ these ] frame materials 51, 52, 53, and 54 is explained to a detail.

[0043] First, the cross-section configuration of the side edge frame material 54 is explained using drawing 4 . In addition, by explanation of the following cross-section configurations, the left in drawing 4 is made into the outside which constitutes the rim of a solar cell module 2, and the direction of drawing Nakamigi is explained that it is the side which supports the body 4 of a solar cell module, i.e., the inside.

[0044] As shown in drawing 4 , while the side edge frame material 54 is equipped with frame body 54a which has a rectangular closed section, after extending in the upper part from the outside edge (left end in drawing) of the top face of this frame body 54a, extended piece 54b which bends and changes to the inside (drawing Nakamigi side) is prepared. Thereby, slot 54e into which the periphery section of the body 4 of a solar cell



module fits among 54d of level parts of top-face 54c of frame body 54a and extended piece 54b is formed. Moreover, flange 54f which the inferior surface of tongue of the body 4 of a solar cell module contacts protrudes on the inside edge (drawing Nakamigi side edge) of top-face 54c of frame body 54a. In addition, the width method (the vertical direction dimension in drawing 4 ) of this slot 54e is slightly set up greatly rather than the thickness dimension of the body 4 of a solar cell module.

[0045] Moreover, after extending horizontally slightly, 54g of extended pieces which bend and change upwards protrudes on the side face of the outside (left-hand side in drawing) of frame body 54a.

[0046] In addition, it has the cross-section configuration where the side edge frame material 53 of another side is also the same. On the other hand, as shown in drawing 3 (this drawing 3 shows the bottom frame material 52), the cross-section configuration of the top frame material 51 and the bottom frame material 52 equips it with flange 52i prolonged from the lower limit of frame body 52a to the inside (drawing Nakamigi side) while equipping the interior of frame body 52a with the bis-stop sections 52h and 52h which have a bis-hole.

[0047] Next, the connection structure of each frame materials 51, 52, and 53 and 54 comrades is explained. Here, the connection structure of the bottom frame material 52 and the side edge frame material 54 is hung up and explained to an example using drawing 3 . As shown in drawing 3 , 54d of level parts is not prepared in extended piece 54b of the side edge part of the longitudinal direction of the side edge frame material 54. Moreover, frame body 54a of this part does not become closed section structure, either, but is formed as a flat side where the end face of the bottom frame material 52 can contact. Furthermore, the bis-holes 54h and 54h for carrying out the bis-stop of the end face of the bottom frame material 52 to the side edge part of this side edge frame material 54 are formed in two corresponding to the above-mentioned screw stop sections 52h and 52h.

[0048] In case each [ these ] frame materials 52 and 54 are connected The side edge part of the bottom frame material 52 to the side edge part of the side edge frame material 54 in the condition of having made in agreement the superposition (referring to the arrow head of the alternate long and short dash line of drawing 3 ), the bis-stop sections 52h and 52h, and bis-holes [ 54h and 54h ] location By screwing in the screw which is not illustrated, both the frame materials 52 and 54 of each other are connected. Similarly, each side edge part of the side edge part of another side of this side edge frame material 54, the side edge part of the top frame material 51 and the side edge part of the side edge frame material 53 of another side, the top frame material 51, and the bottom frame material 52 is also connected. Thus, each frame materials 51, 52, 53, and 54 of each other will be connected, and the frame 5 of the shape of a frame as shown in drawing 2 will be constituted.

[0049] Moreover, a solar battery will be directly thatched by the roof part of a residence by carrying out a nail stop to the purline where this frame 5 constitutes a roof 1.

[0050] - explanation - of the water cutoff structure of the body 4 of a solar cell module, and a frame 5, next the water cutoff structure of the body 4 of a solar cell module and frame 5 which are the description of this gestalt -- the following -- the 1- explain the 3rd operation gestalt.

[0051] (The 1st operation gestalt) Two kinds of water cutoff members, the 1st and the 2nd, 61 and 62 are used for this operation gestalt. Drawing 5 is the top view showing the

condition of having attached each water cutoff members 61 and 62 in the side edge frame material 54. The sectional view where drawing 6 (a) met D-D line of drawing 5 , the sectional view where drawing 6 (b) met the E-E line of drawing 5 , and drawing 6 (c) are the sectional views which met the F-F line of drawing 5 .

[0052] As shown in these Figs., the 1st water cutoff member 61 arranged so that the open part of slot 54e for supporting the body 4 of a solar cell module may be covered is formed in the part except a part for the both ends of the longitudinal direction of the side edge frame material 54. This 1st water cutoff member 61 is a member of the shape of sheet metal formed of foam, such as EPDM, and is prepared ranging over flange 54f from 54d of level parts of extended piece 54b of the side edge frame material 54. Moreover, this 1st water cutoff member 61 is pasted up on a part for a this flange 54f point (I part in drawing 6 (a)). That is, to 54d of level parts of extended piece 54b, it is only in contact (II part in drawing 6 (a)), and, in this edge, the 1st water cutoff member 61 serves as the free end. Furthermore, the thickness dimension of this 1st water cutoff member 61 is slightly set up greatly rather than the dimension which carried out the value which subtracted the thickness dimension of the body 4 of a solar cell module from the width method (longitudinal-direction dimension in drawing 6 (a)) of slot 54e of the side edge frame material 54 1/2.

[0053] On the other hand, the 2nd water cutoff members 62 and 62 are arranged in a part for the both ends of the longitudinal direction in slot 54e of the side edge frame material 54. While this 2nd water cutoff member 62 is formed of foam, such as the same EPDM as the above-mentioned 1st water cutoff member 61 Insertion partial 62a of the shape of a cube inserted in slot 54e of the side edge frame material 54 as shown in drawing 7 , When the side edge part of the side edge frame material 54 is contacted and other frame materials 51 and 52 are connected, it has pinching partial 62b of the shape of the triangle pole put among both these frame materials. Moreover, this 2nd water cutoff member 62 is formed so that the consistency in the condition that each frame materials 51, 52, 53, and 54 were connected, and the body 4 of a solar cell module was attached may become to the consistency of the above-mentioned 1st water cutoff member 61 more than an EQC. Furthermore, as shown in drawing 6 (b), the lap of the arrangement field of the above-mentioned 1st water cutoff member 61 and the arrangement field of the 2nd water cutoff member 62 is carried out partially (it overlaps).

[0054] The above-mentioned explanation explained the arrangement condition of each water cutoff members 61, 62, and 62 in one side edge frame material 54. In the side edge frame material 53 of another side, each water cutoff members 61, 62, and 62 are arranged similarly, and each water cutoff members 61, 62, and 62 are further arranged similarly in the top frame material 51 and the bottom frame material 52.

[0055] Next, insertion actuation of the body 4 of a solar cell module over each frame materials 51, 52, 53, and 54 is explained. This insertion actuation is performed to connection and coincidence of each frame materials 51, 52, and 53 and 54 comrades (refer to drawing 3 ). That is, a solar cell module 2 will be produced by connecting each [ these ] frame materials 51, 52, and 53 and 54 comrades, inserting in the body 4 of a solar cell module to each frame materials 51, 52, 53, and 54.

[0056] Here, it explains on behalf of the actuation at the time of inserting in the body 4 of a solar cell module to the side edge frame material 54.

[0057] By this insertion actuation, the 1st and 2nd water cutoff members 61 and 62

deform [ both ] by the thrust from the body 4 of a solar cell module. Hereafter, deformation actuation of each water cutoff members 61 and 62 is explained in full detail. [0058] As shown in drawing 8 , free one end (part located in the bottom in drawing 8 ) of this 1st water cutoff member 61 is stuffed into the interior of slot 54e with the body 4 of a solar cell module, and deformation of the 1st water cutoff member 61 deforms so that it may coil around the periphery section of the body 4 of a solar cell module in accordance with the inside of this slot 54e. For this reason, between the insides of slot 54e, the 1st water cutoff member 61 will exist, respectively a front-face [ of the periphery section of the body 4 of a solar cell module ], and rear-face side. As mentioned above, under the present circumstances, the thickness dimension of the 1st water cutoff member 61 The width method of slot 54e ) [ <A

HREF="/Tokujitu/tjitemdrw.ipdl?N0000=237&N0500=1E\_N/;>

<=<?;;?///&N0001=611&N0552=9&N0553=000010" ] Since it is slightly set up greatly rather than one half of the values which subtracted the thickness dimension of the body 4 of a solar cell module from the vertical direction dimension in TARGET="tjitemdrw"> drawing 8, Where this insertion actuation is completed, the 1st water cutoff member 61 will be in the condition of having been compressed between the inside of slot 54e, and the external surface (a front face and rear face) of the body 4 of a solar cell module.

[0059] On the other hand, the 2nd water cutoff member 62 is compressed toward the back side of slot 54e by the thrust from the body 4 of a solar cell module to be shown in drawing 9 . Also in this case, where insertion actuation is completed, the 2nd water cutoff member 62 will be in the condition of having been compressed between the inside of slot 54e, and the external surface of the body 4 of a solar cell module.

[0060] Thus, the 1st and 2nd water cutoff members 61 and 62 will exist between the inside of slot 54e, and the external surface of the body 4 of a solar cell module, where a compression set is carried out, and the water cutoff engine performance between slot 54e of the side edge frame material 54 and the body 4 of a solar cell module is secured good. In addition, in the part in which the 1st water cutoff member 61 and the 2nd water cutoff member 62 carried out the lap as shown in drawing 6 (b), the water cutoff function by both [ these ] the water cutoff members 61 and 62 will be obtained.

[0061] Such insertion actuation is performed also between the other frame materials 51, 52, and 53 and the body 4 of a solar cell module. Therefore, in the condition that production of a solar cell module 2 was completed, the perimeter enclosure of the body 4 of a solar cell module will be covered, and the water cutoff engine performance between frame materials 51, 52, 53, and 54 will be obtained good.

[0062] As explained above, according to this operation gestalt, the water cutoff structure between these both can be acquired to the insertion activity and coincidence to the frame materials 51, 52, 53, and 54 of the body 4 of a solar cell module. And this water cutoff structure is acquired as a very high thing of the water cutoff engine performance.

Therefore, coexistence with reservation of sufficient water cutoff engine performance and good water cutoff workability can be aimed at. Moreover, even if it is the case where it applies to the residence near the seashore in connection with the water cutoff engine performance being secured, concern of the salt damage by the salinity of the ultralow volume contained in atmospheric air is cancelable.

[0063] Moreover, although the drying time until a wet sealing material hardens completely was needed by the method which used the conventional wet sealing material,

with this gestalt, the need does not exist and a water cutoff activity can be completed in a short time. Moreover, the activity of wiping off the wet sealing material adhering to parts other than a need part is also unnecessary, and is good. [ of workability ]

[0064] Furthermore, even if the configuration of the clearance between slot 54e of the body 4 of a solar cell module and a frame 54 is complicated, since it deforms so that the water cutoff member 61 compressed may coil around the body 4 of a solar cell module, good water cutoff workability will be secured. Moreover, since the above-mentioned water cutoff members 61 and 62 are [ that there is nothing ] applicable with respect to the configuration of a clearance, the versatility over two or more kinds of solar batteries is acquired, a standardization of the water cutoff members 61 and 62 is possible for them, and they can aim at reduction of cost.

[0065] In addition, with this operation gestalt, each water cutoff members 61 and 62 are beforehand attached in each frame materials 51, 52, 53, and 54. That is, each water cutoff members 61 and 62 are attached by the production process of each frame materials 51, 52, 53, and 54. For this reason, the production processes of the body 4 of a solar cell module with much processing routing can be reduced, and improvement in the productivity of the body 4 of a solar cell module can be aimed at.

[0066] Moreover, since the 2nd water cutoff member 62 has the consistency more than an EQC to the 1st water cutoff member 61, in the connection parts of each frame materials 51, 52, and 53 and 54 comrades, the very high water cutoff engine performance is obtained. On the contrary, the reason for having set the consistency of the 1st water cutoff member 61 to below equivalent rather than the 2nd water cutoff member 62 is for avoiding that a frame material bends by superfluous compression of this 1st water cutoff member 61.

[0067] (The 2nd operation gestalt) This operation gestalt pastes up a water cutoff member on the inside of the slot on the frame material beforehand. Here, it explains on behalf of the case where it applies to the side edge frame material 54.

[0068] As shown in drawing 10 , the whole abbreviation for the medial surface (field facing the building envelope of slot 54e) of 54d of level parts of extended piece 54b of the side edge frame material 54 was covered, and the water cutoff member 63 has pasted up. This water cutoff member 63 is set up to about 40 percent to the width method (the vertical direction dimension in drawing 10 ) of thickness dimension fang furrow 54e.

[0069] Thus, after the water cutoff member 63 has pasted the inside of slot 54e, the height dimension of the space formed between the water cutoff member 63 and top-face 54c of frame body 54a is smaller than the thickness dimension of the body 4 of a solar cell module.

[0070] Thus, if insertion actuation of the body 4 of a solar cell module is performed to slot 54e of the constituted side edge frame material 54, the amount of [ of this body 4 of a solar cell module ] top surface part will contact the water cutoff member 63, and the thrust which goes to the back side of slot 54e to this water cutoff member 63 will act. Moreover, since the height dimension of slot 54e is slightly set up greatly rather than the thickness dimension of the body 4 of a solar cell module, the field where this thrust acts is the bottom field part of the water cutoff member 63.

[0071] For this reason, as shown in drawing 11 , it deforms toward the back side of bottom field partial fang furrow 54e of the water cutoff member 63, and that part reaches the pars basilaris ossis occipitalis of slot 54e. On the other hand, since the inside of top-

face fang furrow 54e of this water cutoff member 63 is pasted, the top field part of the water cutoff member 63 is pinched between the inside of this slot 54e, and the top side of the body 4 of a solar cell module.

[0072] In addition, since the closure member 43 which changes with spring materials, such as rubber, is attached in a part for the periphery edge of the rear face of the body 4 of a solar cell module as mentioned above, the closure of the clearance between the rear face of this body 4 of a solar cell module and top-face 54c of frame body 54a of the side edge frame material 54 is carried out by this closure member 43. Such water cutoff structure is adopted between each frame materials 51, 52, 53, and 54 and the body 4 of a solar cell module.

[0073] Thus, also in this gestalt, the water cutoff structure between these both can be acquired to the insertion activity and coincidence to the frame materials 51, 52, 53, and 54 of the body 4 of a solar cell module. And with this gestalt, since water is mainly cut off in the front-face side of the body 4 of a solar cell module, permeation of storm sewage etc. can be prevented certainly. Thus, even if it is in this gestalt, coexistence with reservation of sufficient water cutoff engine performance and good water cutoff workability can be aimed at. Not only with it but with this gestalt, compared with the case of the 1st operation gestalt, the volume of the water cutoff member 63 can be made small, the good water cutoff engine performance can be obtained with a small amount of ingredient, and a cost cut can be aimed at.

[0074] (The 3rd operation gestalt) This operation gestalt makes a water cutoff member insert in the inside of the slot on the frame material beforehand. Here, it explains on behalf of the case where it applies to the side edge frame material 54.

[0075] As shown in drawing 12 (a), the water cutoff member 64 concerning this gestalt has the slightly larger cross-section configuration than the cross-section configuration of slot 54e of a frame material 54. Especially, it is set up more greatly than the height dimension of height dimension fang furrow 54e of the water cutoff member 64 in drawing 12. Moreover, the dimension of the longitudinal direction (the direction of a space vertical of drawing 12 (a)) of this water cutoff member 64 is in agreement with the dimension of the longitudinal direction of slot 54e.

[0076] For this reason, as shown in drawing 12 (b), the water cutoff member 64 is beforehand inserted in the interior of slot 54e of a frame material 54, and the body 4 of a solar cell module is inserted in to this slot 54e. According to this, before inserting in the body 4 of a solar cell module, the water cutoff member 64 is already inserted in the condition of having been compressed inside slot 54e of a frame material 54. The water cutoff member 64 will be in the condition of having been compressed further from this condition by insertion of the body 4 of a solar cell module (refer to drawing 12 (c)), and the clearance between the inside of slot 54e of a frame material 54 and the body 4 of a solar cell module will be filled.

[0077] For this reason, even if it is in this gestalt, coexistence with reservation of sufficient water cutoff engine performance and good water cutoff workability can be aimed at. It is not necessary to paste up not only it but the water cutoff member 64 on the inside of slot 54e of a frame material 54. For this reason, although exfoliation of a releasing paper is required when adhesive tape is used in order to paste up the water cutoff member 64, with this gestalt, that need does not exist and reduction of an activity man day can be aimed at.

[0078] - Explanation of the water cutoff structure of other parts - Each operation gestalt mentioned above mainly explained the water cutoff structure between frame materials 51, 52, 53, and 54 and the body 4 of a solar cell module. Below, the water cutoff structure of the other part is explained. The following water cutoff structures can be combined also to the water cutoff structure between the frame materials 51, 52, 53, and 54 and the bodies 4 of a solar cell module in which operation gestalt mentioned above.

[0079] (Water cutoff structure of the connection part of frame materials) As shown in drawing 13 and drawing 14 (G view Fig. [ in / a, and / in b / a ]), it is a part for the both ends of the side edge frame material 54, and the plate-like water cutoff member 65 is attached at least in each part which the edge of the top frame material 51 and the bottom frame material 52 contacts. [ the top view of a frame material 54 ] Moreover, these bis-holes 54h and 54h, the diameter of said, or the large holes 65a and 65a of a path are slightly formed in the part corresponding to the bis-holes 54h and 54h which this water cutoff member 65 is also formed of the water cutoff member of each operation gestalt mentioned above, and the same foam, and were formed in the frame material 54. Moreover, the same configuration is adopted also to the side edge frame material 53 of another side.

[0080] By having formed such a water cutoff member 65, where a frame material 52 and 54 comrades are connected, it will intervene, where the water cutoff member 65 is compressed between both this frame material 52 and 54 comrades, and the water cutoff engine performance between both this frame material 52 and 54 comrades is obtained good.

[0081] (Water cutoff structure inside a frame material) As shown in drawing 15, it is formed in the building envelope of frame body 54a of the side edge frame material 54 of foam, and the water cutoff member 66 is inserted in it in the state of compression. The same configuration is adopted also to the other frame materials 51, 52, and 53.

[0082] According to this configuration, permeation of the water inside the side edge frame material 54 can be prevented, and the water cutoff engine performance of the solar cell module 2 whole can be conjointly secured good with the water cutoff engine performance in each above-mentioned operation gestalt.

[0083] - Other operation gestalten - Each gestalt mentioned above explained the case where this invention was applied to the solar cell module directly thatched by the roof part of a residence. This invention may be applied to the solar cell module installed not only this but on a roofing tile.

[0084] Moreover, as each water cutoff member, you may be foam of not only EPDM but others. Moreover, each water cutoff member should just be an ingredient which has not only foam but tychopotamic and elasticity.

[0085]

[Effect of the Invention] As mentioned above, in this invention, the water cutoff member which closes the clearance between the body of a solar cell module and the frame which supports it is beforehand arranged in the insertion slot formed in the frame, and above-mentioned both water cutoff structure is made to be acquired by the insertion activity and coincidence of the body of a solar cell module. Moreover, this water cutoff structure is acquired as a very high thing of the water cutoff engine performance by the compression set of a water cutoff member. For this reason, coexistence with reservation of sufficient water cutoff engine performance and good water cutoff workability can be aimed at.

Moreover, since the water cutoff member is beforehand arranged in a frame, the production processes of the body of a solar cell module with much processing routing can be reduced, and improvement in the productivity of the body of a solar cell module can also be aimed at.

[0086] Although the drying time until a wet sealing material hardens completely was needed by the method which used the conventional wet sealing material, in this invention, the need does not exist, a water cutoff activity can be completed in a short time, and shortening of the production time amount of a solar cell module can be attained. Moreover, the activity of wiping off the wet sealing material adhering to parts other than a need part is also unnecessary, and is good. [ of workability ]

[0087] Furthermore, even if the configuration of the clearance between the body of a solar cell module and a frame is complicated, good water cutoff workability can be secured by the water cutoff member which carries out a compression set.

[0088] Thus, especially, since coexistence with reservation of sufficient water cutoff engine performance and good water cutoff workability can be aimed at, when thatching a solar battery directly as roofing material, or when applying to the residence near the seashore (when anxious about permeation of storm sewage), big effectiveness can be demonstrated (when anxious about the salt damage by the salinity of the ultralow volume contained in atmospheric air).

[0089] Moreover, when the water cutoff member of a class which is different in a part for both ends and the central part of a longitudinal direction of an insertion slot is arranged, the water cutoff engine performance demanded by every place of the longitudinal direction of an insertion slot can be obtained to arbitration, and the high solar cell module of practicality can be offered.

[0090] Moreover, when insert in a water cutoff member, and it is made to deform in accordance with the inside configuration of a slot and is made to twine this water cutoff member round [ the rim part of the body of a solar cell module ] by inserting the body of a solar cell module in an insertion slot, a water cutoff member can be twined good to the body of a solar cell module of any configurations, the water cutoff engine performance between frames can be obtained good, and the still higher water cutoff engine performance can be obtained.

[0091] Furthermore, especially when a water cutoff member is beforehand attached only in the field which counters a front-face side among the fields which counter a field [ which counters the front-face side of the body of a solar cell module in an insertion slot ], and rear-face side, the configuration which can prevent permeation certainly to the storm sewage with which we are anxious about permeation can be obtained, and the high solar cell module of practicality is obtained.

[0092] A water cutoff member can be made to hold into an insertion slot, without needing means, such as adhesion, for it, when the water cutoff member which has a bigger cross-section configuration than the cross-section configuration of this insertion slot is inserted in the interior of an insertion slot in the state of compression. For this reason, exfoliation of a releasing paper like [ at the time of using adhesive tape ] can become unnecessary, an activity man day can be reduced, and simplification of an insertion activity of the body of a solar cell module can be attained.

[0093] Moreover, a frame is accomplished with two or more frame materials, and when the water cutoff member of the configuration which carried out abbreviation agreement is

beforehand attached in the frame material of one side or a water cutoff member is arranged in the interior of a frame material in the state of compression at the configuration of the contact part of the frame material contacted mutually, the water cutoff engine performance of the whole solar cell module can be conjointly secured good with each above-mentioned water cutoff structure.

[0094] When the charge of foam is adopted as a concrete ingredient which constitutes the above-mentioned water cutoff member, elasticity good to a water cutoff member is acquired, the water cutoff engine performance by the compression set is fully demonstrated, and each above-mentioned effectiveness can be acquired certainly.

[0095] Furthermore, by using the frame for solar cell modules in the manufacture approach of each solar cell module mentioned above, the arrangement process of a water cutoff member can be incorporated in the production process of a frame, the process for making the body of a solar cell module equipped with a water cutoff member becomes unnecessary, and improvement in the productivity of the body of a solar cell module can be aimed at.

### **[Field of the Invention]**

This invention relates to the frame for solar cell modules used for the solar cell module installed in the roof part of a housing building etc., and the manufacture approach list of this solar cell module by it. It is related with the amelioration for securing especially the water cutoff engine performance between the body of a solar cell module, and the frame which supports it.

### **[Description of the Prior Art]**

The solar battery which is conventionally generated using clean solar energy with very little effect on earth environment unlike the thermal power station which burns fossil fuels, such as petroleum, nuclear electric power generation with difficult processing of trash, etc. is known. This solar battery is being adopted also as a common residence with the fall of a price in recent years. By preparing the privately owned electrical power facilities by such solar battery, it becomes possible to obtain power, without requiring the power transmission from an electric power company in the daytime. And when dump power arises in a generation of electrical energy in the daytime, it is also possible to carry out the electricity sales to utilities of this dump power to an electric power company.

[0003] Generally, this kind of solar battery has the solar cell module with which the body of a solar cell module was supported and constituted by the frame. That is, the slot for inserting in the periphery section of the body of a solar cell module is established in the frame, and these both are made to unify by inserting the periphery section of the body of a solar cell module in this slot.

[0004] By the way, such a building-materials one apparatus solar cell module of a configuration fully secures the water cutoff engine performance between the body of a solar cell module, and a frame, and it is necessary to make it storm sewage etc. not permeate from the clearance between these both. Hereafter, the conventional water cutoff method is explained.

[0005] - Method which used the wet sealing material - As shown in drawing 16 (a), this method pours sealing material d, such as silicon resin, into the clearance c between the



body a of a solar cell module, and Frame b, and fills this clearance c.

[0006] - elastic material compression method - this method makes the elastic material e, such as EPDM (ethylene-propylene-diene terpolymer), intervene between the body a of a solar cell module, and Frame b, as shown in drawing 16 (b) That is, when the body a of a solar cell module is inserted in the slot b1 of Frame b, the configuration of the clearance formed among these both a and b is made to carry out abbreviation agreement, and the elastic material e is formed in it (the elastic material e is formed in a slightly larger configuration than this clearance configuration in fact). And while inserting this elastic material e in the slot b1 of Frame b, the periphery section of the body a of a solar cell module is inserted in this elastic material e (refer to drawing Nakaya mark). Under the present circumstances, between Frame b and the body a of a solar cell module, the elastic material e will be compressed and between the inside of the slot b1 of Frame b and the bodies a of a solar cell module will be filled without a clearance.

[0007] - foam compression method - this method is indicated by JP,9-217470,A. As shown in drawing 16 (c), the periphery section of the body a of a solar cell module is beforehand pasted up and equipped with the water cutoff member f which changes by foam, and, specifically, the periphery section of this body a of a solar cell module is inserted in the slot b1 of Frame b. Thereby, like the elastic material compression method mentioned above, a clearance is lost between Frame b and the body a of a solar cell module, and the good water cutoff engine performance can be obtained.

### **[Effect of the Invention]**

As mentioned above, in this invention, the water cutoff member which closes the clearance between the body of a solar cell module and the frame which supports it is beforehand arranged in the insertion slot formed in the frame, and above-mentioned both water cutoff structure is made to be acquired by the insertion activity and coincidence of the body of a solar cell module. Moreover, this water cutoff structure is acquired as a very high thing of the water cutoff engine performance by the compression set of a water cutoff member. For this reason, coexistence with reservation of sufficient water cutoff engine performance and good water cutoff workability can be aimed at. Moreover, since the water cutoff member is beforehand arranged in a frame, the production processes of the body of a solar cell module with much processing routing can be reduced, and improvement in the productivity of the body of a solar cell module can also be aimed at.

[0086] Although the drying time until a wet sealing material hardens completely was needed by the method which used the conventional wet sealing material, in this invention, the need does not exist, a water cutoff activity can be completed in a short time, and shortening of the production time amount of a solar cell module can be attained. Moreover, the activity of wiping off the wet sealing material adhering to parts other than a need part is also unnecessary, and is good. [ of workability ]

[0087] Furthermore, even if the configuration of the clearance between the body of a solar cell module and a frame is complicated, good water cutoff workability can be secured by the water cutoff member which carries out a compression set.

[0088] Thus, especially, since coexistence with reservation of sufficient water cutoff engine performance and good water cutoff workability can be aimed at, when thatching a solar battery directly as roofing material, or when applying to the residence near the

seashore (when anxious about permeation of storm sewage), big effectiveness can be demonstrated (when anxious about the salt damage by the salinity of the ultralow volume contained in atmospheric air).

[0089] Moreover, when the water cutoff member of a class which is different in a part for both ends and the central part of a longitudinal direction of an insertion slot is arranged, the water cutoff engine performance demanded by every place of the longitudinal direction of an insertion slot can be obtained to arbitration, and the high solar cell module of practicality can be offered.

[0090] Moreover, when insert in a water cutoff member, and it is made to deform in accordance with the inside configuration of a slot and is made to twine this water cutoff member round [ the rim part of the body of a solar cell module ] by inserting the body of a solar cell module in an insertion slot, a water cutoff member can be twined good to the body of a solar cell module of any configurations, the water cutoff engine performance between frames can be obtained good, and the still higher water cutoff engine performance can be obtained.

[0091] Furthermore, especially when a water cutoff member is beforehand attached only in the field which counters a front-face side among the fields which counter a field [ which counters the front-face side of the body of a solar cell module in an insertion slot ], and rear-face side, the configuration which can prevent permeation certainly to the storm sewage with which we are anxious about permeation can be obtained, and the high solar cell module of practicality is obtained.

[0092] A water cutoff member can be made to hold into an insertion slot, without needing means, such as adhesion, for it, when the water cutoff member which has a bigger cross-section configuration than the cross-section configuration of this insertion slot is inserted in the interior of an insertion slot in the state of compression. For this reason, exfoliation of a releasing paper like [ at the time of using adhesive tape ] can become unnecessary, an activity man day can be reduced, and simplification of an insertion activity of the body of a solar cell module can be attained.

[0093] Moreover, a frame is accomplished with two or more frame materials, and when the water cutoff member of the configuration which carried out abbreviation agreement is beforehand attached in the frame material of one side or a water cutoff member is arranged in the interior of a frame material in the state of compression at the configuration of the contact part of the frame material contacted mutually, the water cutoff engine performance of the whole solar cell module can be conjointly secured good with each above-mentioned water cutoff structure.

[0094] When the charge of foam is adopted as a concrete ingredient which constitutes the above-mentioned water cutoff member, elasticity good to a water cutoff member is acquired, the water cutoff engine performance by the compression set is fully demonstrated, and each above-mentioned effectiveness can be acquired certainly.

[0095] Furthermore, by using the frame for solar cell modules in the manufacture approach of each solar cell module mentioned above, the arrangement process of a water cutoff member can be incorporated in the production process of a frame, the process for making the body of a solar cell module equipped with a water cutoff member becomes unnecessary, and improvement in the productivity of the body of a solar cell module can be aimed at.

### **[Problem(s) to be Solved by the Invention]**

However, a technical problem which is described below occurred by the all directions formula mentioned above.

[0009] - Since the technical-problem-book method of the method which used the wet sealing material pours a wet sealing material into few clearances between the body of a solar cell module, and a frame, it is difficult for it to check whether the perimeter enclosure of a solar battery is covered and water can be cut off completely, and the dependability of the water cutoff engine performance cannot fully secure it.

[0010] Moreover, if a wet sealing material does not harden completely, sufficient water cutoff engine performance will not be obtained. For this reason, the predetermined drying time was needed after impregnation of a wet sealing material, and the technical problem that working hours will be required for a long time occurred. Moreover, the check of the hardening was complicated.

[0011] Furthermore, when the wet sealing material had adhered to parts other than a need part during an activity, the wiping activity was needed and aggravation of working efficiency was caused.

[0012] - When the configuration of the clearance between the body of a technical-problem-solar cell module of an elastic material compression method and a frame is complicated, processing of elastic material will become complicated. Moreover, when the configuration of a clearance is complicated in this way, by elastic material, it may become impossible to fill completely the clearance between a frame and the body of a solar cell module, and the dependability of the water cutoff engine performance cannot fully secure it.

[0013] Moreover, there is no versatility over two or more kinds of solar batteries. That is, if it puts in another way according to the configuration of the above-mentioned clearance, since it is necessary to prepare the elastic material of dedication according to the class of solar battery, a standardization of elastic material is difficult and will cause increase of cost.

[0014] - As well as the case of the technical-problem-above-mentioned elastic material compression method of a foam compression method when the configuration of a clearance is complicated, the dependability of the water cutoff engine performance may fully be unable to secure. moreover, when the periphery section of the body of a solar cell module was inserted in the slot on the frame, possibility that foam will begin to see to the light-receiving side side of a solar battery was high, removal of foam (foam which it began to see) excessive as after treatment of the above-mentioned insertion activity was needed, and aggravation of working efficiency was caused. Moreover, the design of the foam for avoiding the flash of this foam was difficult.

[0015] As mentioned above, by each conventional water cutoff method, neither of both sides of reservation of sufficient water cutoff engine performance and good water cutoff workability were securable.

[0016] Thatching a solar battery directly as roofing material is performed without using a roofing tile with the fireproof improvement in a solar cell module especially in recent years. If it is in a such type solar cell module, since a solar battery functions also as a roofing tile, aiming at improvement in the dependability of the above-mentioned water cutoff engine performance poses a much more important problem. Moreover, when

applying to the residence (for example, residence with an area of the seashore to 500m) near the seashore, in order to be anxious about the salt damage by the salinity of the ultralow volume contained in atmospheric air, it is also important to realize the configuration for preventing invasion of this salinity.

[0017] This invention is made in view of this point, and the place made into the purpose is to provide with the frame for solar cell modules the manufacture approach list of the solar cell module and solar cell module which can acquire good water cutoff workability while aiming at reservation of sufficient water cutoff engine performance, and positive inhibition of invasion of salinity.

### **[Brief Description of the Drawings]**

[Drawing 1] It is the perspective view showing the roof part of the residence where the solar cell module concerning an operation gestalt was thatched.

[Drawing 2] B view Fig. [ in / (a), and / in (b) / (a) ] and (c) are C view Figs. in (a). [ the top view of a solar cell module ]

[Drawing 3] It is the decomposition perspective view of the III part in drawing 2 .

[Drawing 4] It is the sectional view of a frame material.

[Drawing 5] It is the top view showing the condition of having attached each water cutoff member in the side edge frame material in the 1st operation gestalt.

[Drawing 6] The sectional view where (a) met D-D line of drawing 5 , the sectional view where (b) met the E-E line of drawing 5 , and (c) are the sectional views which met the F-F line of drawing 5 .

[Drawing 7] It is the perspective view of the 2nd water cutoff member.

[Drawing 8] It is the sectional view showing the deformation condition of the 1st water cutoff member.

[Drawing 9] It is the sectional view showing the deformation condition of the 2nd water cutoff member.

[Drawing 10] It is the sectional view showing the arrangement condition of the water cutoff member in the 2nd operation gestalt.

[Drawing 11] It is the sectional view showing the deformation condition of the water cutoff member in the 2nd operation gestalt.

[Drawing 12] Starting the 3rd operation gestalt, drawing showing insertion actuation of a water cutoff member [ as opposed to a frame material in (a) ], drawing in which (b) shows insertion actuation of a solar cell module, and (c) are drawings showing the deformation condition of a water cutoff member.

[Drawing 13] It is the drawing 3 equivalent Fig. showing the water cutoff structure of the connection part of frame materials.

[Drawing 14] It is G view Fig. [ in / (a) and / in (b) / (a) ] [ the top view of a frame material ]

[Drawing 15] It is the sectional view of the frame material in which the water cutoff structure inside a frame material is shown.

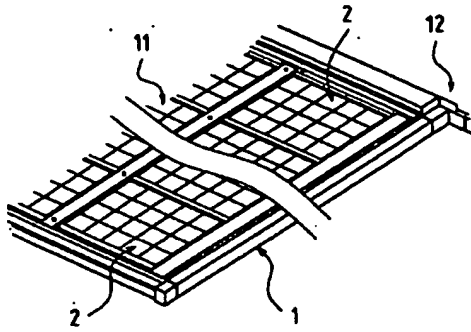
[Drawing 16] The conventional water cutoff method is shown and the method with which (a) used the wet sealing material, and (b) are drawings showing an elastic material compression method and (c) foam compression method.

[Description of Notations]

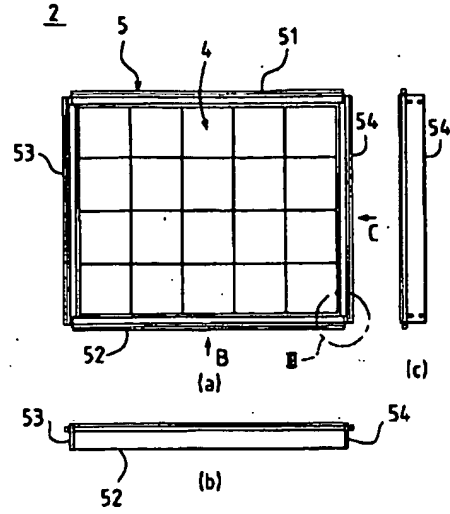
2 Solar Cell Module

4 Body of Solar Cell Module  
5 Frame  
51-54 Frame material  
51e - 54e slot  
61-66 Water cutoff member

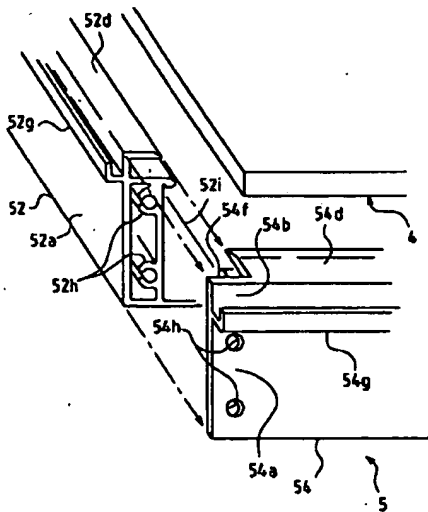
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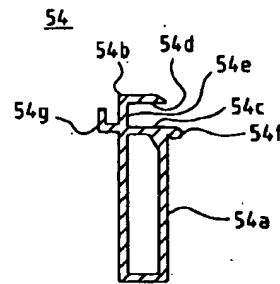
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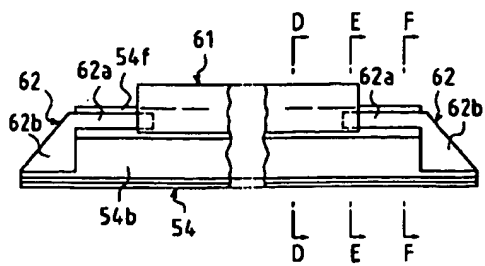
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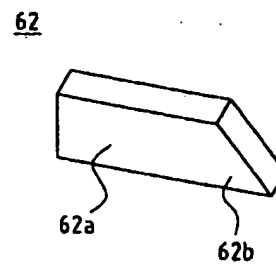
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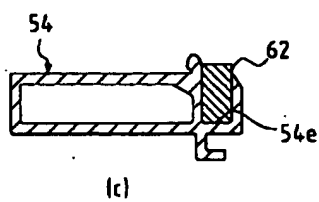
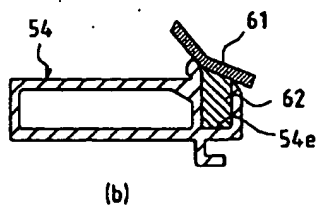
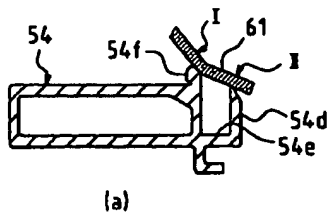
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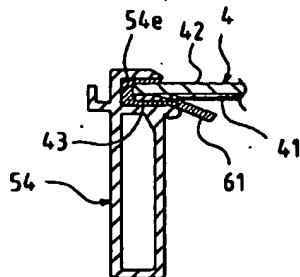
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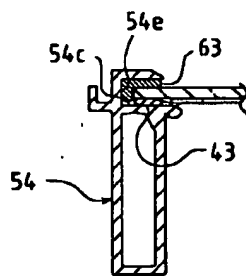
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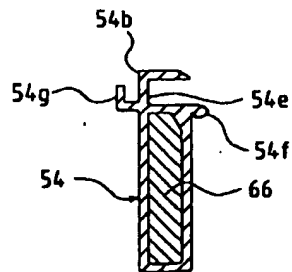
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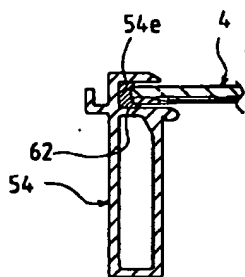
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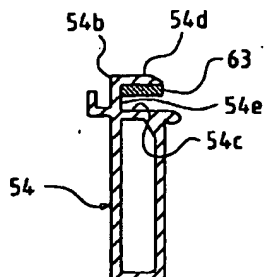
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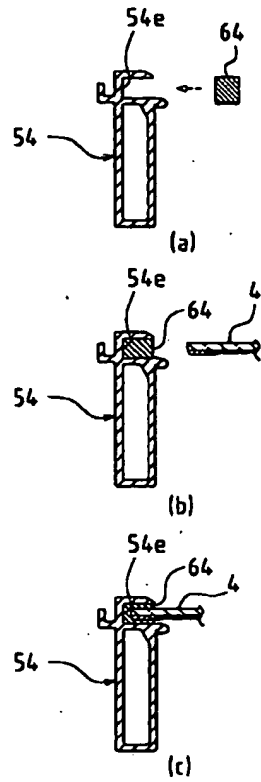
【図9】



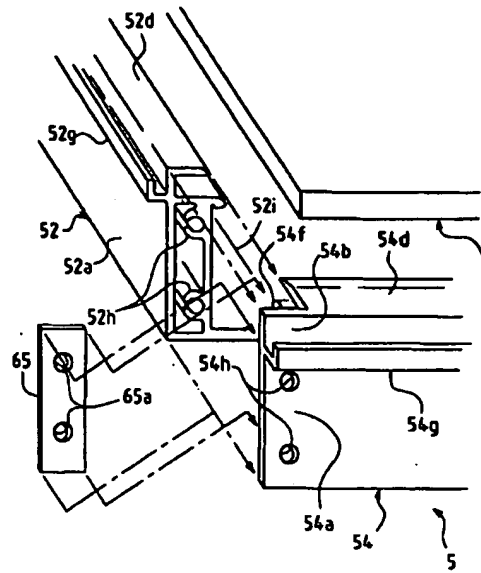
【図10】



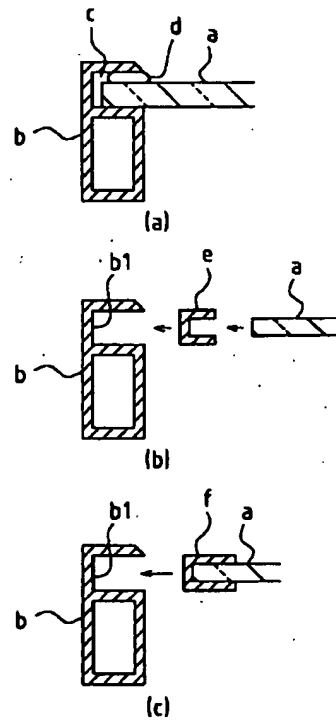
【図12】



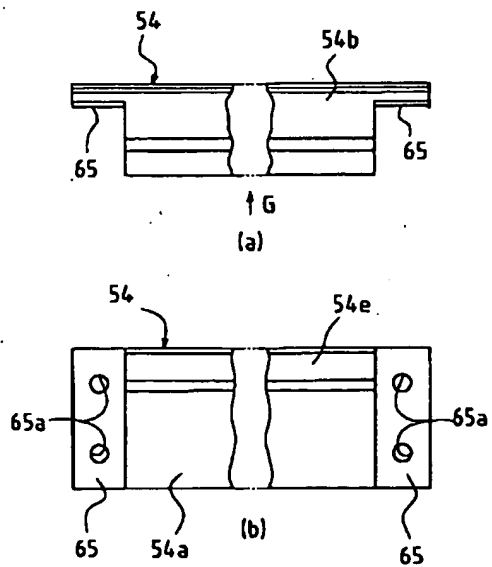
【図13】



【図16】



【図14】





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